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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/402,955 | 02/14/2000 | NIDHAM BEN RACHED | 518-1006 | 6672 |

7590 07/11/2003
BARNES & THORNBURG
PO BOX 2786
CHICAGO, IL 60690-2786

EXAMINER

ODOM, CURTIS B

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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2634

DATE MAILED: 07/11/2003

9

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/402,955

Applicant(s)

BEN RACHED ET AL.

Examiner

Curtis B. Odom

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 April 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1 and 2 is/are rejected.
- 7) ☒ Claim(s) 3-14 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 April 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Objections

1. Claim 1 is objected to because of the following informalities: The word "antennae" is suggested to be changed to "antennas". Appropriate correction is required.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bahai et al (U.S. Patent No. 6, 097, 770).

Regarding claim 1, Bahai et al. discloses a method of estimating a communication path, the method necessitating an estimate of the impulse response (column 2, lines 39-44) of the channels, comprising the steps of:

acquiring (column 5, lines 9-41 and column 6, lines 65-66) a time statistic of the transmission path; and

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establishing (column 7, lines 19-65 and column 10, lines 19-22) a corrected impulse response at least by weighting said impulse response estimates by means of the time statistic and additive noise of the channels.

Bahai et al. does not disclose the communication path contains a plurality of channels associated with a plurality of antennas, the statistic is a space statistic, the additive noise is an estimate.

However, it would have been obvious to one of ordinary skill in the art at the time the invention was made that if the communication path contained a plurality of channels that the method of Bahai et al. could have been performed for the plurality of channels in the same manner that it is performed from the singular channel. The impulse response could have been estimated and corrected for each individual channel in the plurality of channels by using the method of Bahai et al. It would have also been obvious to one of ordinary skill in the art that a time statistic is a functional equivalent of a space statistic. A space statistic is defined as a set of data reflecting the behavior of the path over a predetermined period. Since the estimate (time statistic) of Bahai et al. reflects the behavior of the path over a predetermined period (column 5, lines 9-41 and column 6, lines 65-66) it is obvious that it could be used as a space statistic.

Bahai et al. also states using additive noise to correct the impulse response. However, Bahai et al. does not disclose the additive noise is an estimate. However, it would have been obvious to one of ordinary skill in the art that the use of a more precise amount of additive noise rather than an estimate would generate a more accurate corrected impulse response. Thus, claim 1 does not constitute patentability.

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Regarding claim 2, which inherits the limitations of claim 1, Bahai et al, discloses the time statistic corresponds to an estimate of the correlation of said communication channels taken two by two (column 5, lines 29-33), wherein the FIR filter estimates the correlation of the communication channel two by two.

Allowable Subject Matter

4. Claims 3-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Curtis B. Odom whose telephone number is 703-305-4097. The examiner can normally be reached on Monday- Friday, 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 703-305-4714. The fax phone numbers for the organization where this application or proceeding is assigned are 703-872-9314 for regular communications and 703-872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-3900.

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Curtis Odom

July 7, 2003



STEPHEN CHIN
SUPERVISORY PATENT EXAMINER
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